

Solving Systems of Equations (3x3)

Recall Solving 2x2's

- graphing
 - substitution
 - elimination
- } often not practical if solving 3x3's
- ← focus on using elimination to solve 3x3's.

Example

- ① $x - 2y + 3z = 3$
- ② $2x + 5z = 8 - y \Rightarrow 2x + y + 5z = 8$
- ③ $3x - y - 3z = -22$

Eliminate y

$$\begin{array}{r} \textcircled{2} \quad 2x + \cancel{y} + 5z = 8 \\ \textcircled{3} + (3x - \cancel{y} - 3z = -22) \\ \hline \textcircled{4} \quad 5x + 2z = -14 \end{array}$$

Eliminate y

$$\begin{array}{r} \textcircled{1} \quad x - 2y + 3z = 3 \\ \textcircled{2} \times 2 \quad (2x + y + 5z = 8) \Rightarrow \begin{array}{r} x - 2y + 3z = 3 \\ + (4x + 2y + 10z = 16) \\ \hline \textcircled{5} \quad 5x + 13z = 19 \end{array} \end{array}$$

Now we have a 2x2:

$$\begin{array}{r} \textcircled{4} \quad 5x + 2z = -14 \\ \textcircled{5} \times (-1) \quad (-5x + 13z = 19) \Rightarrow \begin{array}{r} 5x + 2z = -14 \\ + (-5x + 13z = 19) \\ \hline -11z = -33 \\ \boxed{z = 3} \end{array} \end{array}$$

Sub $z = 3$ into ④

$$\begin{array}{r} 5x + 2z = -14 \\ 5x + 2(3) = -14 \\ 5x + 6 = -14 \\ 5x = -20 \\ \boxed{x = -4} \end{array}$$

Sub $x = -4$ and $z = 3$ into ②

$$\begin{array}{r} 2x + y + 5z = 8 \\ 2(-4) + y + 5(3) = 8 \\ -8 + y + 15 = 8 \\ y + 7 = 8 \\ \boxed{y = 1} \end{array}$$

To do:

- ① Group Work - Conditional Solutions.
- ② 3x3 Practice (Elimination)
- ③ Concept Check \Rightarrow Thursday.